concrete construction

APRIL 1958 VOL. 3, NO. 4

EDITED FOR All who are concerned with quality, JOB PLACED CONCRETE (including prestress, tilt-up, lift slab, and thin-shell)—its production, handling, forming, reinforcing, placing, finishing, and curing: CONCRETE CONTRACTORS; GENERAL CONTRACTORS; INDUSTRIAL CONSTRUCTION AND MAINTENANCE MEN; ENGINEERS; ARCHITECTS; STATE HIGHWAY ENGINEERS; READY-MIXED CONCRETE PRODUCERS.

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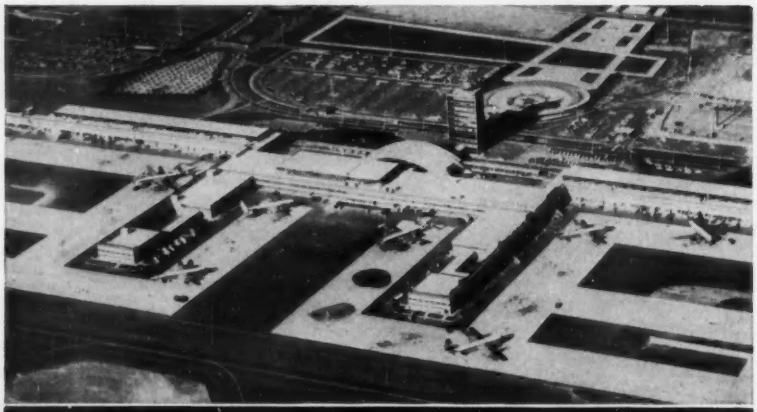

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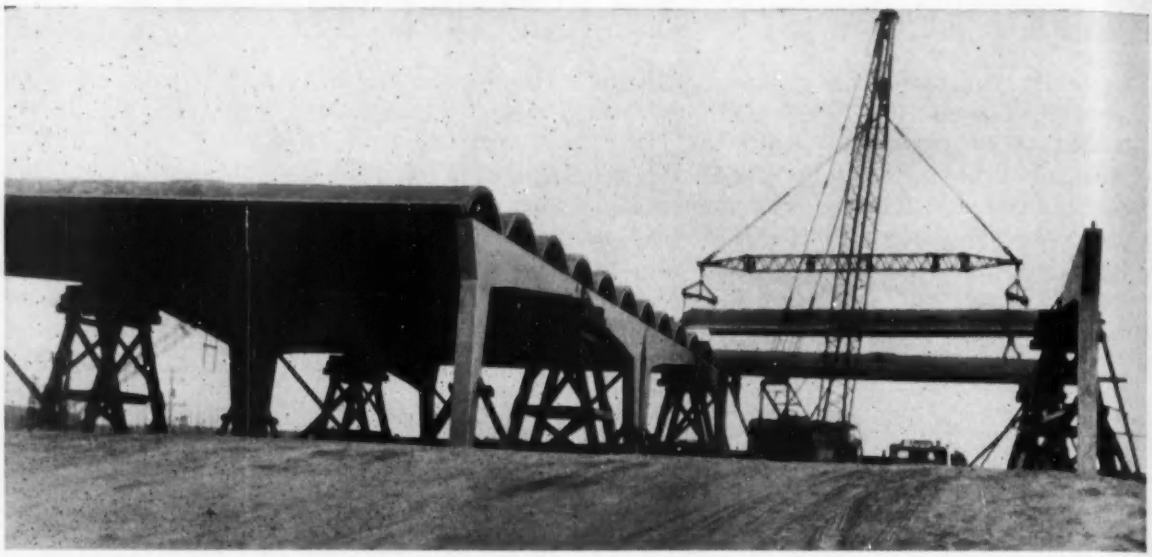


3 PAIRS OF PRECAST BENTS support roof arches for Westmoor High School gymnasium, Daly City, California. Middle pair divides 104′ width of 180′ long structure into separate gyms for boys and girls. Mario Ciampi, architect; Isadore Thompson, structural engineer; Theo. G. Meyer & Sons, general contractor, all are in San Francisco. Kelley Bros., San Jose, erection contractor.

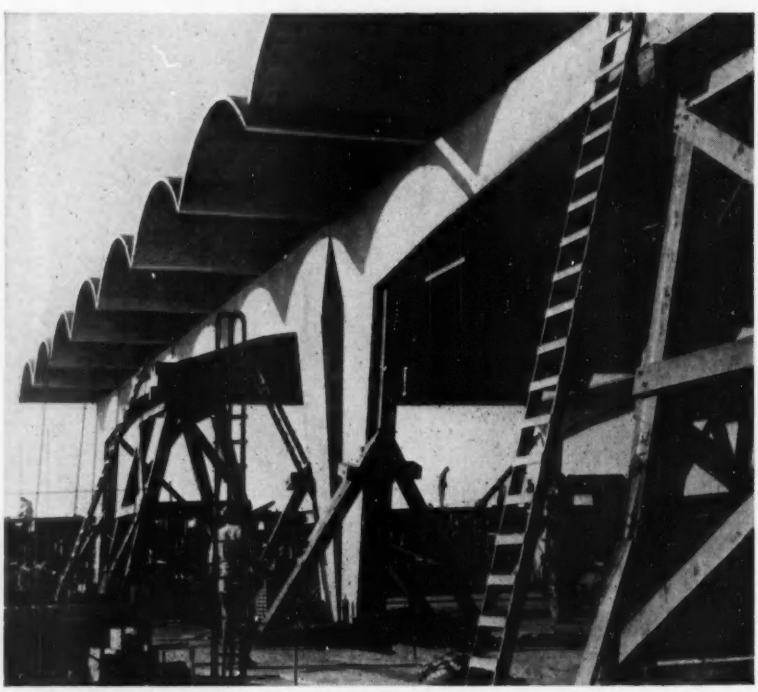
Precast roof arches span 52′ without in-place forms

PIONEERING a recent design concept, precast thin-shell concrete arches, spanning 52′ between bents, form a low-cost roof for this school gymnasium. The barrel arches, 61′ long, including a 9′ cantilever overhang, and 15′ wide with a 3½′ rise, are only 3½″ thick. Each of the arches weighs 20 tons.

It took less than an hour for a motor crane to install each arch on precast 90′-span supporting bents. Precasting of bents and roof arches eliminated forming a concrete space frame 22′ above floor level which would have more than doubled the cost. A real saving.

In-place structural framing costs ($1.37 per sq. ft. for roof shells and $0.81 for bents) averaged out at $2.18 per sq. ft. for the 90′x50′ column spacing.

Precasting the 24 roof arches was handled nicely by a line of forms which produced 6 arches at a time. Six arches were poured in less than 4 hours using lightweight 3000 psi concrete, properly processed in uniform batches by truck mixers of certified design, capacity, mixing speed and water control accuracy.



TIMBER FALSEWORK TOWERS temporarily supported bents at center of 90′ span until entire roof load was applied. There are two rows of 12 arches each in the roof.

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CORBETTA ADDRESSES FIRST CONCRETE CONTRACTORS CONVENTION

ROGER CORBETTA, himself one of the nation's foremost concrete contractors and also founder of the well-known Concrete Industry Board of New York City, told the first annual convention of the National Concrete Contractors Association at Chicago that their organization represented a development long overdue. The whole field of concrete construction, Mr. Corbetta said, is coming into its own much faster than anyone can possibly realize.

Mr. Corbetta urged the contractors assembled in Chicago to stop thinking of themselves as subcontractors and accept the larger responsibilities that must inevitably result from the growing use of concrete for structural frame purposes. In accounting for the growing popularity of concrete construction, Mr. Corbetta pointed out that it permits work to start immediately without an interminable wait for structural steel. In addition to impressive economic advantages, concrete alone among all major building materials has the unique ability to be cast on the job site in any shape or form or color. The speaker recalled the remarkable performance of naval landing craft built of precast units during World War II. Although the hulls of these structures were only 1½ inches thick, they took all the strains, rigors and abuse of service at sea and of landing operations. These concrete craft, Mr. Corbetta said, proved over a period of 5 or 6 years that they were drier than steel hulls and considerably easier to patch.

Noting that in many parts of the world concrete is already the dominant material of construction, Mr. Corbetta predicted that methods of construction here in the United States are going to change with unbelievable rapidity in the years just ahead. The speaker stated unequivocally that such competitive materials as brick, steel and plaster are inevitably giving way to both poured-in-place and precast concrete. He urged his listeners to be particularly alert to the possible new markets for structural concrete that can be opened up through job-site precasting techniques.

The speaker expressed the belief that in order to face the challenge that their industry must meet in the years just ahead, concrete contractors have urgent need of a strong, dedicated national organization. His own firm, Corbetta Construction Company, although it started out as a concrete contracting organization, eventually found it necessary to shift over into the field of general contracting. With concrete today accounting for approximately 35 per cent of the average structure, Mr. Corbetta believes that it is essential that the concrete contractor be prepared at all times to take on the responsibility for the entire structure. These increased responsibilities, coupled with the increasingly powerful organizations being formed by other building trades, make it essential in Mr. Corbetta's opinion that the concrete contractor form a strong organization of his own to gain the power of a collective voice.

Mr. Corbetta reviewed briefly the history of the Concrete Industry Board of New York City, a group formed to bring together all of the widely dispersed organizations whose activities in one way or another affect the quality of concrete construction work. In the belief that the entire field would benefit if the various elements had an effective organization through which to achieve united action, the founders of the Board gradually persuaded the various industry groups to pool their efforts. After an uphill struggle the Board has finally succeeded in bringing together such diverse elements as concrete contractors, commercial testing laboratories, ready-mixed concrete producers, architects, engineers, cement manufacturers and producers of reinforcing steel. The very existence of a composite group of this type has a tendency to discourage the practice of buck-passing when things go wrong.

Roger Corbetta

Ours, Mr. Corbetta said, is the only trade that manufactures its product at the construction site. All other trades have factories. Because of this, and because of the growing importance of concrete in every type of construction, the speaker believes that there is a real need for the formation of concrete industry boards in every part of the country. There is no limit to the possibilities of our industry, Mr. Corbetta said in closing. Our biggest problem today is one of deciding what we are going to do about the challenge before us.

One of the features of the Chicago meeting was an exhibit of equipment, tools and materials presented at the Coliseum. The show was under the direct sponsorship of the Concrete

Contractors Association of Greater Chicago, and approximately 35 manufacturers participated.

Although attendance at the first annual meeting was somewhat disappointing, tangible progress seems to have been made toward the organization of a national association. According to James St. Clair, executive secretary of the group, approximately 270 members are definitely enrolled in the new national association. Chapter groups from various cities which already have local organizations account for a large share of the initial enrollment, with Cleveland, Chicago, Akron and Dallas figuring prominently in the picture. It is hoped that several chapters may come in from the West Coast following a series of meetings which the officers of the new association planned to attend following their Chicago convention.

Bert Carey, past president of the Chicago area group, was elected to serve as the first president of the National Concrete Contractors Association. He will be assisted by the following officers:

FRED FINOMORE, *1st V. P.*
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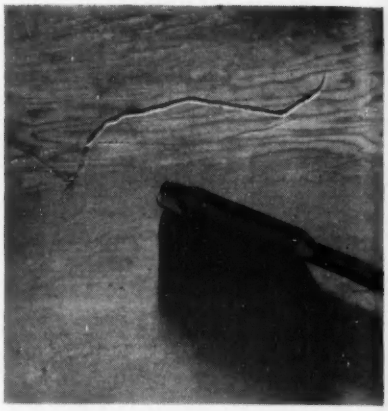
Board of Directors Meeting
July 1958 (Place to be announced)

Full Convention
Tentative—Jan. 15—Feb. 15, 1959

Readers who would like to have additional information on the subject discussed in the foregoing article may request it by filling out one of the reader service cards in this issue.

Rubber Tips Prevent Scars on Finished Concrete



Deep gouges and scars from steel vibrator tip on form face results in additional expense of clean up work.

Smooth finish concrete is produced by use of rubber tipped vibrators because they do not damage form face any more than ordinary pencil eraser. Extends the life of reusable forms.

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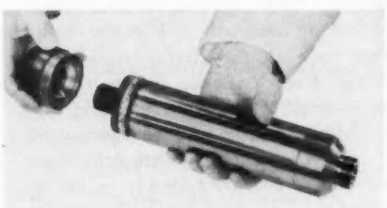

Rubber tip is easily replaced by simply unscrewing worn part and replacing with new tip.

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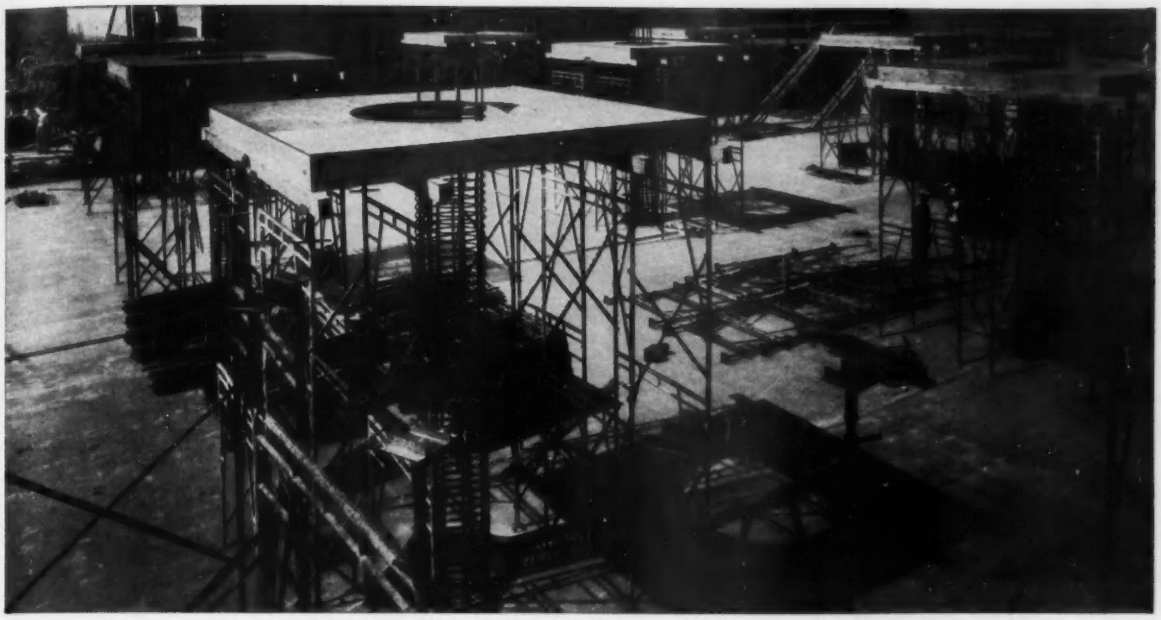

VIEW of a portion of the overall job. More than 2700 "Trouble Saver" Shoring frames support formwork for dropheads and 3" waffle-type floors.

Easily-Handled Shoring Speeds "Crash" Project

By using modern, prefabricated "Trouble Saver" (R) Sectional Steel Shoring, Donald F. Shaw, contractor, gained the release of 40,000 sq. ft. of urgently needed warehouse space ahead of the usual time needed.

Here's how he did it—Sections of "Trouble Saver" Shoring were rapidly assembled to the size and height needed to handle the drophead and 3" waffle-type floor construction. Then these sections were placed on caster leg attachments. This permitted the quick rolling of the Shoring into position for crane lowering of already assembled formwork. Workmen, atop rolling "Trouble Saver" Scaffolding platforms, guided forms on and off the Shoring. More than 2700 "Trouble Saver" Shoring frames on the job kept the concrete flowing.

Shaw also saved considerable time by taking full advantage of the features of "Trouble Saver" Shoring. It is quickly assembled and dismantled on even intricate job conditions such as this. The freestanding sections permit fast, easy placement of stringers, joists and plywood, with minimum nailing required. Adjustable legs reach exact heights, which eliminates cutting, fitting and wedging with wood. The scaffolding sections within the shoring provides working platforms for forming, stripping, placing and removing pans, or other work.

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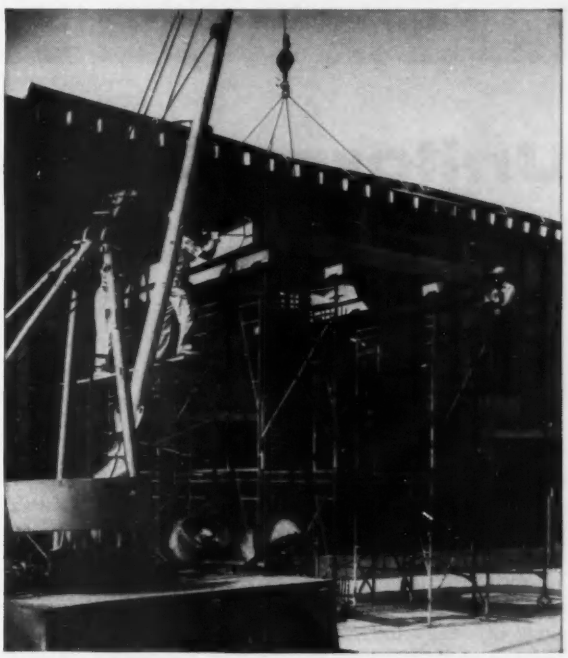

WORKMEN, atop rolling forms "Trouble Saver" Scaffolding, guide "pre-fab" drophead into position. Mobile crane lowers units onto 4x6 stringers with shoring frames already in place. Techniques like these speeded the job.

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Uniform Curb Design . . .

It may not be the easiest goal to achieve but it offers a logical means of fighting the steady rise in street paving costs

BY R. S. MALLOCH
The Hogan Company

IN THE HOPE OF ACCOMPLISHING some needed simplification in the design of curbs and gutters, the writer recently undertook the job of analyzing such designs in 20 different areas in the state of California. The wide range of design differences, the vast majority of which serve no apparent purpose at all, provide at least one explanation for the soaring cost of so much street construction work today.

The findings of the analysis adequately explain why few contractors can afford to assemble forms, finishing tools and other equipment suitable for use in present circumstances in more than one community. Since most communities do not provide sufficient opportunities for curb work to support a good crew working continuously, the result is that curb work tends to become a monopoly of a specialist in each area.

This situation is clearly not in the best interests of the public, and the only possible solution is through the adoption of a uniform design. Uniform design will accomplish the following objectives: offer opportunities for more general bidding; encourage better training of crews; make it possible for contractors to purchase and operate better equipment; and lead to such savings in cost and overhead as will eventually be reflected in lower prices for curb and gutter work.

The accompanying sketch is based largely on the analysis of designs in the 20 California areas covered in the study. It represents a serious attempt to meet the requirements of varying conditions and localities without any sacrifice in respect to utility and appearance. It does no violence to any one of the 20 designs, while making it possible for any contractor to be competitive on curb and gutter work in all 20 areas in the event the uniform design should be adopted.

In the design offered the dimensions listed in the table have been rounded off to the nearest 1/8 inch for convenience of layout and ease of measurement. Excessive refinement of such dimensions is invariably costly when the work is undertaken by the average mechanic.

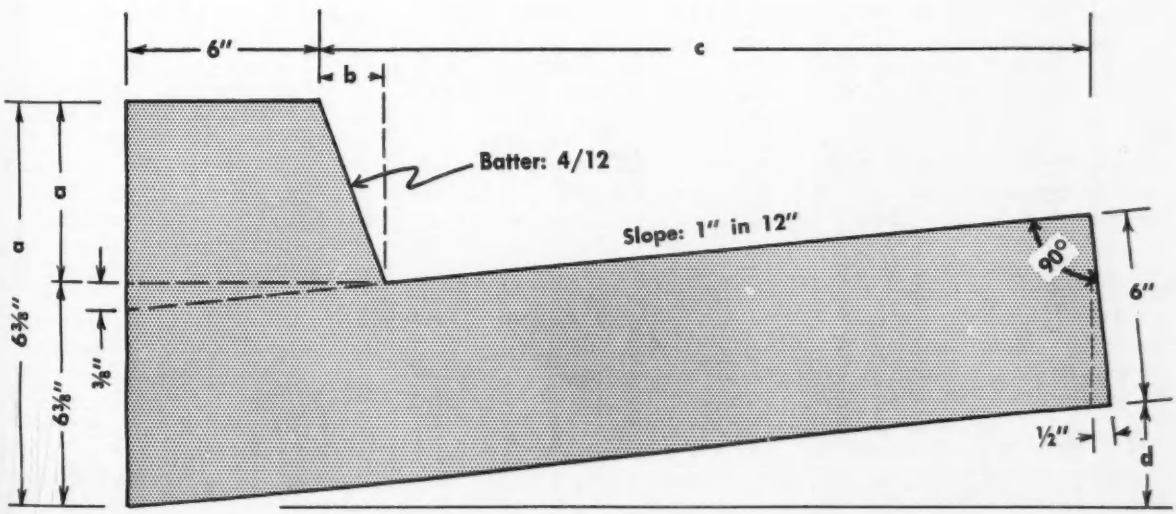
It will be noted that the measurement of the back of the curb is 3/8 inch over the even 2-inch increment. It is suggested that the specifications require that forms for this surface, as well as for the gutter face, be required to extend only to within 1/2 inch of the bottom surface of concrete. In this case it will be possible to use ordinary dimension lumber for forms. Such a tolerance allows for the easy adjustment of form surfaces to grades accurately cut by machine and without hand trimming. The loss of concrete under the forms is found in practice to be only a wedge about 1/2 inch on a side.

The suggested design has the advantage of offering generally accepted batters, slopes and curb widths while providing flexibility of height of face and width of gutter. The trend (confirmed by the 20-area design study) seems to be toward a 24-inch gutter, the cost of which is offset by the cost of pavement replaced and by the cost of maintaining pavement edges where water overflows the narrower widths. The 4/12 batter is recommended as being in accordance with present automobile design. Steeper batters tend to

SUGGESTION FOR UNIFORM CURB DESIGN

Based on Analysis of Designs in 20 California Areas

Dimensions of Curb				Dimensions of Gutter	
Face a	Batter b	Back 6-⅜ + a		Width c	Rise d
6″	2″	12-⅜″		12″	1-½″
8″	2-⅝″	14-⅜″		18″	2″
10″	3-¼″	16-⅜″		24″	2-½″

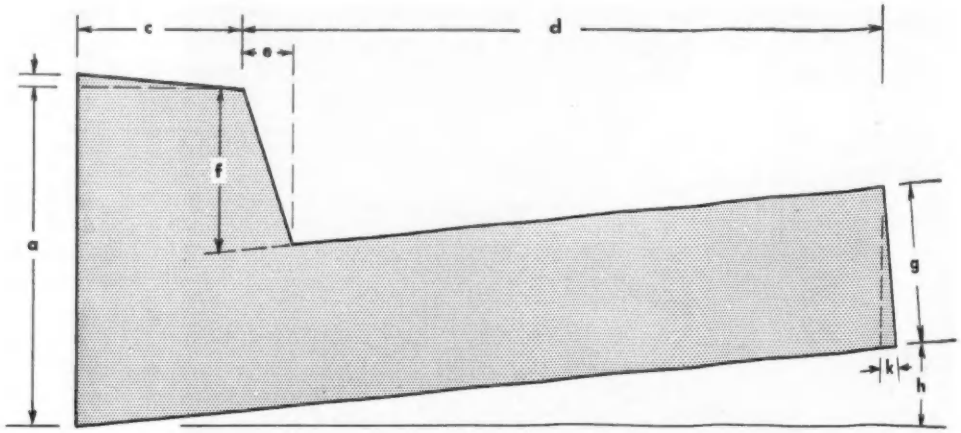


COMPARATIVE DIMENSIONS
Curb and Gutter 20 California Areas

Batter for Curb Face: $e/f = x/12''$

Gutter Slope: $\dfrac{(g + h) - (a - f)}{(d - e)} = y/12''$

Batter for Gutter Face: $k/g = z/12''$



LOCATION	TYPE	a	b	c	d	e	f	g	h	k	x	y	z
State of California	"A"	14	0	6	26	2	8	6	V-	0	3.00	V-	0
County of Los Angeles	B-8	14	0	5	24	2⅜	8	8	0	1	4.00	1.12	1.50
	D	14	0	6	24	2⅜	8	8	0	1	4.00	1.12	1.50
Hawthorne		15	0	6	18	1⅜	8	6	2⅜	0	1.78	.86	0
Inglewood		14	0	6	V-19½	1½	8	V-7½	V-1½	0	2.25	V- .67	0
Long Beach		V-	¼	6	V-	V-	V-	V-6M	V-	V-1	2.00	V-	2.00
Los Angeles	C-8	14	¼	6	26⅜	2⅜	8	7½	0	1⅜	4.00	.75	1.50
Santa Monica		14⅞	0	6	14	2	7½	6	2⅜	0	3.20	1.00	0
Torrance		14	0	6	26⅜	2⅜	8	7½	0	1	4.00	.75	1.38
Upland		14	0	6	10⅜	3⅛	8	7	0	0	.25	1.20	0
County of Merced:													
Merced		15	0	6	25	1	9	6	1½	0	1.33	.75	0
County of Orange		14½	0	6	24	1½	8	6	1⅞	0	2.25	.75	0
Newport Beach		14⅝	0	6	18	1⅝	8	6	1⅛	0	2.00	.54	0
County of Riverside:													
Riverside		14½	¼	6	24	2⅜	8	6	2	NG	4.00	.80	.80
County of San Bernardino		13⅝	0	6	19⅝	1⅝	8	5	1⅝	0	2.34	.67	0
San Bernardino	"B"	15	0	6	19½	1½	8	6	2	0	2.25	.67	0
County of San Diego	"F"	15	0	6	18	2½	8	6	2½	0	3.75	1.16	0
San Diego	"H"	15	0	6	24	2⅜	8	6	2½	0	4.00	.84	0
County of San Luis Obispo:													
San Luis Obispo		14	0	7	V-18	1⅛	8	6	1¼	NG	1.71	.88	.88
County of Stanislaus:													
Modesto		13	0	6	20	1½	7	8	0	1	2.57	1.23	1.50

V—Variable M—Minimum NG—Normal to Gutter

interfere with body trim, hubcaps and lower door edges. On city and residential streets a curb face in excess of 6 inches in height is found to prevent the full opening of many automobile doors.

Variations from the proposed design may be made to meet local conditions (such as catch basins and super elevation), always with full knowledge that such variations add significantly to the cost of the work. In regard to super elevation there seems to be no serious objection to rotating the entire street section in the horizontal plane about its center line, retaining the relative sections of curb in their original position with respect to section in order to achieve the super elevation required, thus permitting the use of curb forms and measuring devices without special adjustment.

On the chance that others may wish to undertake similar analyses in other sections of the country, a comparative dimension sketch is reproduced here, along with a table in which the various dimensions for the 20 areas are entered. The following comments refer to the various columns in the table:

Column a: Most of the specifications for forms for curb and gutter require that the backform be set true to line and grade and extend to the full depth of the concrete. Under this requirement, the widths of backform needed to serve these areas would be: for 6-inch curb face 11 inches, 12 inches, 12 5/16 inches, and 13 inches; and for 8-inch curb face 13 5/16 inches, 14 inches, 14 5/16 inches, 14 1/2 inches, 14 7/8 inches, 15 inches and variable. To save the expense of providing suitable backboard for several areas, contractors generally disregard the provision of the specifications requiring the backboard to be set to grade and use a board wide enough to cover the curb of maximum height, allowing the top edge to project above the concrete. In this case the concrete cannot be struck off to line to secure an even surface.

Column b: In only three areas do the curb detail drawings show a slope on the top surface of the curb, although some others may require that this surface be sloped uniformly with the adjacent sidewalk. In areas where no slope is required, little difficulty is experienced with drainage over this narrow surface. The advantage of setting the back and face forms with the upper edges level, to secure an even finish, appear to outweigh the minor drainage problem.

Column c: Any saving in concrete made by providing a 5-inch curb top for residential areas is largely lost in the cost to the contractor of cutting special spreaders and of pouring the concrete through the narrower opening.

Column d: Most of the differences of dimension in the measurement of gutter result from disagreement in the point from which the measurement is taken, whether at the top of face or from the flowline. The practice of engineers is generally (except for the State of California) to set grade and line from the top of face. Where these dimensions differ from even 6-inch intervals, the increase represents the addition of the amount of batter to the gutter width. Since the amount of batter varies with the height of face, the maintenance of a uniform width of gutter measured from the flowline results in a variable overall width of curb and gutter, according to the height of face required. For this reason it seems proper to measure all gutter widths from the top of face, as a uniform practice.

Column e: This column represents the batter of the curb face. As may be seen from **column x** the various batters vary from 1.33 inches in 12 inches to 4.00 inches in 12 inches. The most uniform practice adopted in the areas of largest population is the use of the 4.00 inches in 12 inches batter. The need of a uniform batter may be illustrated by the case of a freeway being constructed in San Diego County by the State of California. In 1.8 miles of highway there are approximately 34 curb returns issuing into county territory to meet present or proposed county curb. The State curb is battered 2 inches in 8 inches and the County curb is battered 2 1/2 inches in 8 inches. The poor appearance of these joints must be obvious as well as the extra costs of designing and inspecting the required transitions. This difficulty is also frequent in the Los Angeles area.

Column f: The adoption of curb face heights of uniform 2-inch increments (6 inches, 8 inches, 10 inches) together with uniform batter would permit the universal use of curbforms, saving the contractor undue expense in constructing forms to suit the practice of each area, and permitting a more general competition in bidding. It is not considered that this practice would place undue restriction on the freedom of design to suit varying drainage conditions.

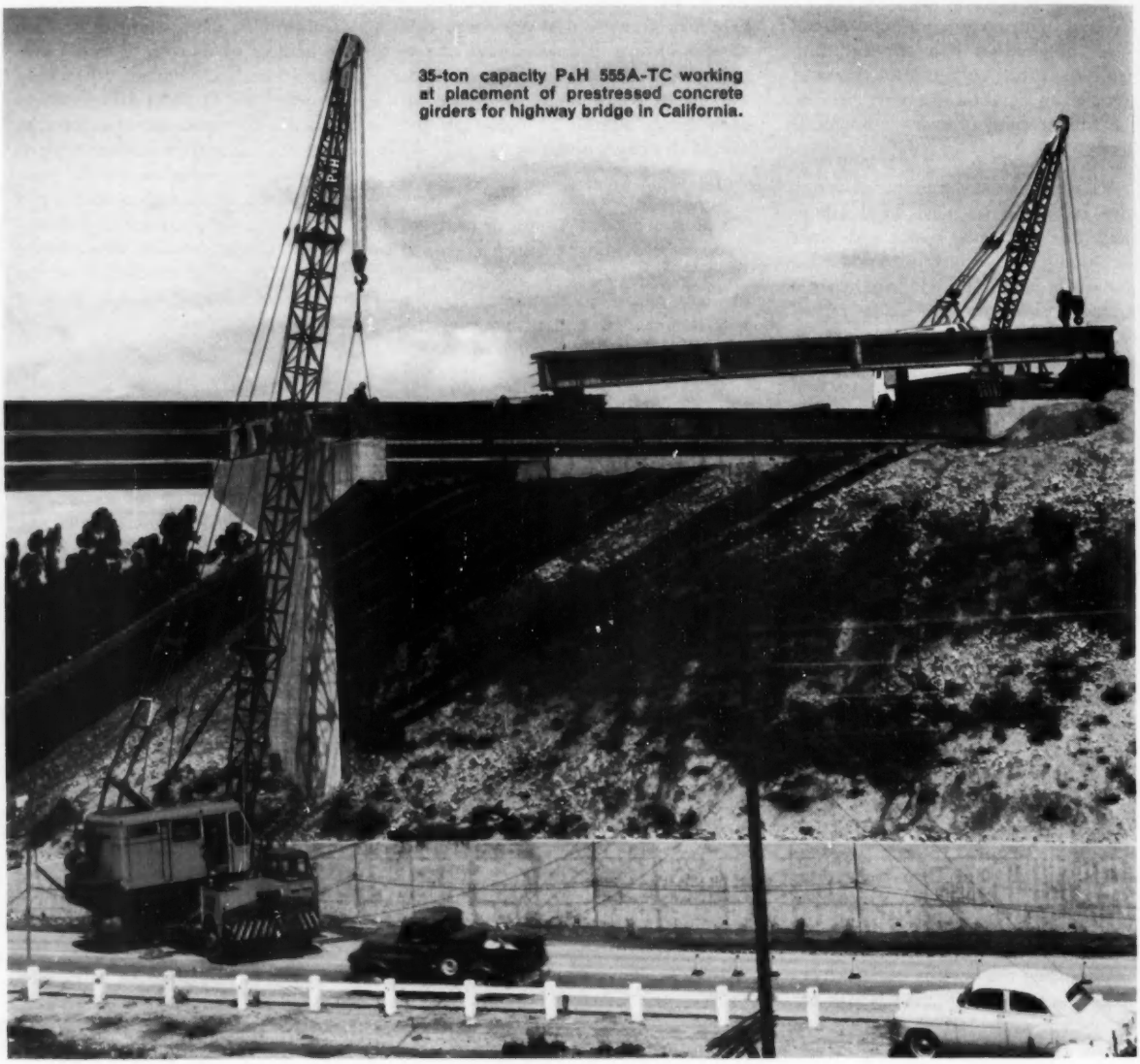
Column g: The use of a 6-inch depth of concrete at the flowline is almost universal. A use of greater depth at the gutter face does not increase the strength of the section, yet entails an increased cost of concrete. Furthermore, the provision of a flat subgrade at each edge of a crowned street section entails substantial costs in grading, removal of excess dirt, and trimming.

Column h: The variation in this dimension, controlling the slope of gutter, as seen in **column y** is from 0.32 inches in 12 inches to 1.20 inches in 12 inches. The same arguments apply here as for uniform batter as in **column e** above.

Column k: The variation in this dimension on the basis of a 12-inch run is set out in **column z**. Some batter to the gutter face is necessary to protect the gutter edge in the process of laying pavement. If, however, this batter is increased to a point where the angle between the gutter slope and face exceeds 90 degrees, the outer edge of the gutter form rises above the line of the slope, resulting in raggedness in striking off the concrete from that surface. The use of a gutter face normal to the slope of the gutter allows for the use of form set with its upper surface parallel to the slope, and at the same time provides substantial batter.

Almost anyone will agree that most of the design differences which show in this study are totally unnecessary, and there can be little doubt that similar conditions exist all over the nation. Not until a serious effort has been made to agree upon uniform designs can we claim really to have come to grips with the problem of controlling spiraling costs. END

NG—Normal to Gutter
M—Minimum
V—Variable



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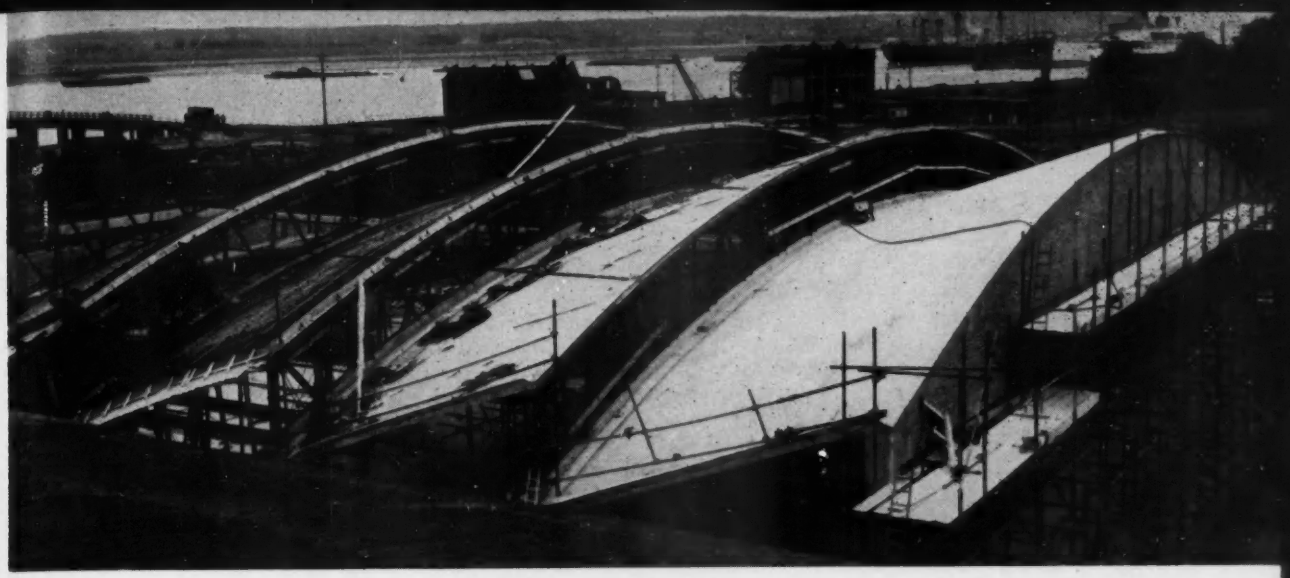


General view showing how a new British design technique makes it possible to construct a sawtooth roof with all the basic advantages of the concrete shell roof.

British Design Cuts Shell Roof Cost

A NEW BRITISH TECHNIQUE has made possible a sharp reduction in construction costs on the pictured concrete shell roof covering a 20,000-square foot area over a clear span of 180 feet. The long span and the reduction in cost are made possible by the use of latticed steel arches to support the concrete shells and their formwork during construction.

Normally spaced at 20- to 25-foot centers, the arches are bridged by 3-inch thick conical-section concrete shells which span the distance between the top chord of one arch and the bottom chord of the adjoining arch. In order to resist horizontal spread the shells are prestressed after erection by means of a high-tensile tie-rod which stretches between the springing of the arches.

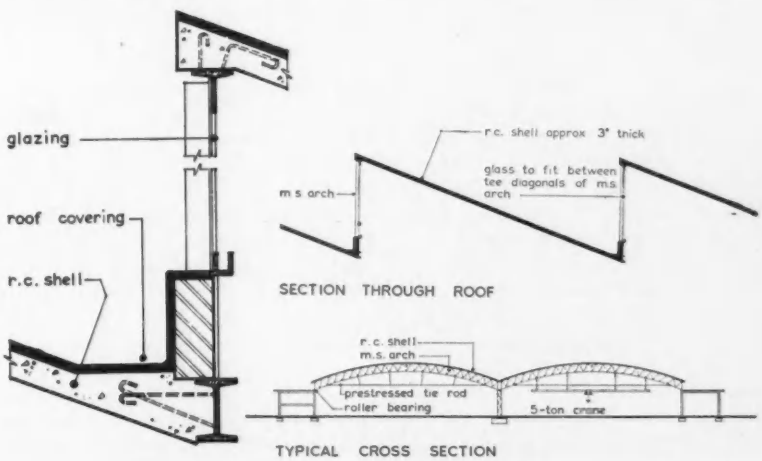
At the level of the bottom chord of each arch an arched channel is formed in the shell to collect rainwater and deliver it to downspouts or gutters located at the level of the eaves. The triangular panels formed by the members of the arches are designed to receive either single or double glazing.

The economy of this system of construction is in part a result of the fact that the roof permits economical superstructure and foundation designs, since only bending moments due to wind loads are transmitted to the supporting columns and end walls. Clear spans of between 80 and 210 feet are readily obtainable with point loadings up to 10 tons from any point in the roof. To reduce roof volume and save heating costs, the arches are designed with a rise of only one-tenth of the total span.

The A. T. A. Industrial Company, Ltd. of Bristol, England, in association with Modern Engineering, Ltd., also of Bristol, are the license holders for the new so-called Silberkuhl method.

END

The three cross sections in the drawing below show how a new British design technique makes it possible to combine the advantages of northlight roof construction with thin-shell concrete.



The roof of a Florida motel made this strange appearance while under construction. The site precast hyperbolic paraboloid concrete shells, each weighing approximately 5 tons, were hoisted by crane and welded to the top of reinforced concrete columns. The open areas between the overlapping slabs were filled with translucent plastic skylights.

Florida motel makes unique use of . . .

Concrete Roof Shells

A RADICAL INNOVATION in modern motel building, featuring a roof of site precast hyperbolic paraboloid concrete shells, has won national recognition for the architect who made this novel use of concrete in a $175,000 hostelry now nearing completion at Warm Mineral Springs, Florida. This exciting use of concrete, although not altogether unique in the annals of American architecture, does involve an entirely new method of employing concrete roof shells, according to the nationally-renowned architect.

Warm Springs is about 40 miles north of Fort Myers on the heavily-traveled Tamiami Trail leading to Miami. Since this area abounds in health-seekers, and because Warm Springs has an abundance of mineral water, the new concrete structure was designed to attract tourists on the prowl for Florida's legendary "Fountain of Youth," and this directly influenced the concrete construction of the inn.

The structural system consists of a series of square concrete hyperbolic paraboloids in two heights and measuring 14 feet 5 inches on a side. All precasting was done at the job site. Since the supporting precast, prestressed columns occur in the soundproof partitions between units, different ceiling levels result, defining use areas, with lower surfaces over sleeping and dining areas, higher planes above the living space.

As may be seen in the pictures, a side view of this motel bears some resemblance to cocktail glasses lined up by the hundreds. The "stems" are prestressed columns that separate the units.

Each roof slab is cast in the form of an inverted peak, resembling from the top a square cake which has fallen in the middle. To form the roof, these 5-ton slabs were crane-hoisted and welded atop the concrete columns in their peak-down position. Rain drains down to the center of the slabs and runs through a hole in the center of the supporting column to a central

Here a welder is shown fastening one of the shells to its center supporting column. Since the shells are depressed at the center, the pipe serves to catch rain water and becomes part of a drainage system which embraces all of the shells.

FILE: THIN-SHELL

Here one of the precast inverted-umbrella-type roof shells is shown being lifted from a casting form. Old tire carcasses not only were helpful in the lifting process but also served to guard the corners from damage during the handling operations.

drainage system.

The upright columns are built on two levels, with every other one either several inches lower or higher than the adjacent column. This means the roof slabs overlap slightly, and the space between is filled with translucent plastic skylights.

Eighty roof slabs were poured on the job to cover the 20-unit motel, and each unit measures 14 by 28 feet. Center columns are also welded at their bases to a steel plate set below the concrete floor slab. Since each of the shells has a steel collar at the top, these were welded to the steel in the supporting column after each shell was stabilized atop its column. Plexiglass fills the spaces above door height between the higher and lower shell levels. Each shell is 2 inches thick and measures 2 feet from its apex to its perimeter.

Since the shells had to be lifted very soon after casting, they were removed from their molds within 48 to 72 hours and stored for three weeks to cure. There are four different heights in each motel unit and each building has a 7-foot front and a 7-foot back in the overhang. An unusually rich mix was employed to attain the desired strength for early lifting from the molds. Since the soil is a mixture of sand and marl, the foundation footing slab was made 10 inches thick and 2½ feet square for each column base. Each shell took about 1½ cubic yards of ready mixed concrete. END

All the slabs were precast on the job-site, using assembly-line techniques. Two of the casting beds are shown in the foreground, while at the right may be seen the portable covering that was built to facilitate curing.

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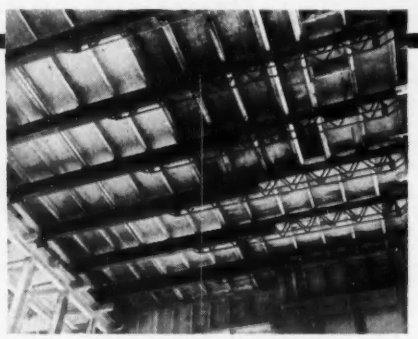

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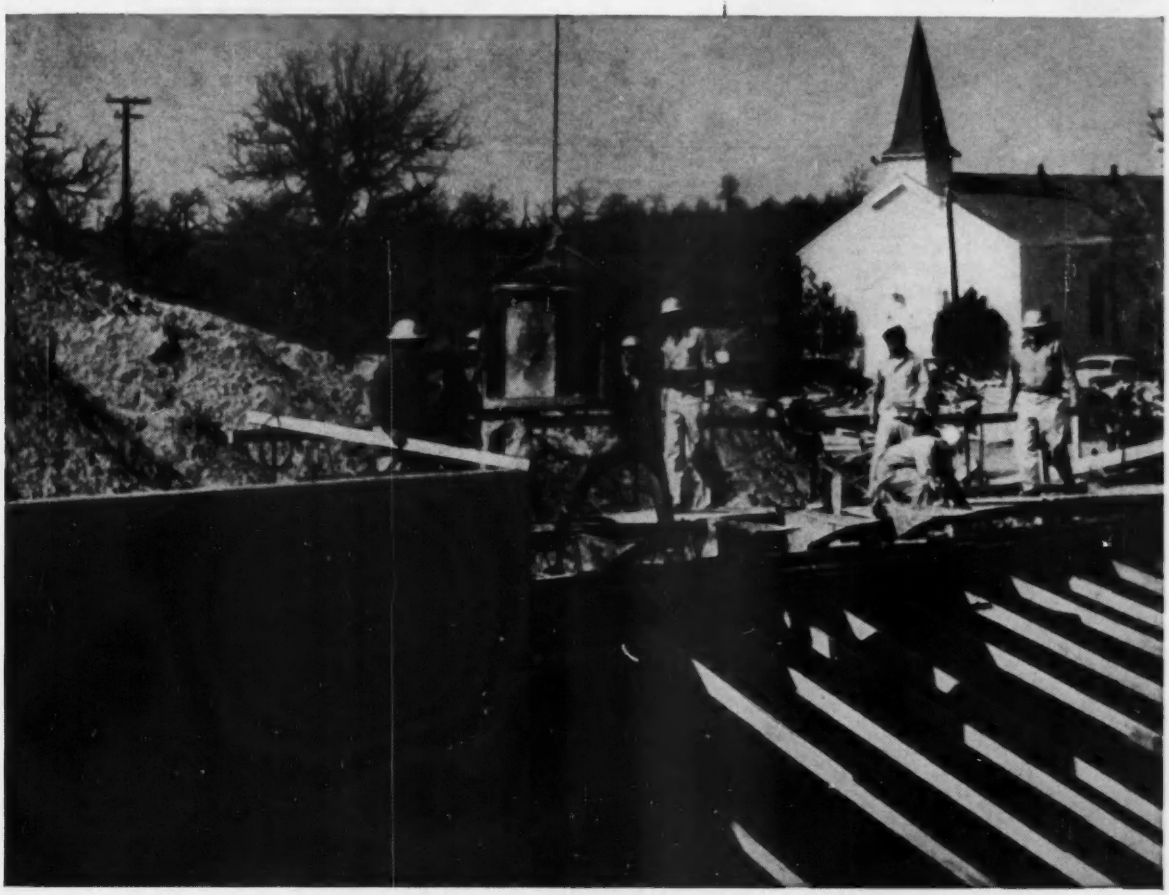

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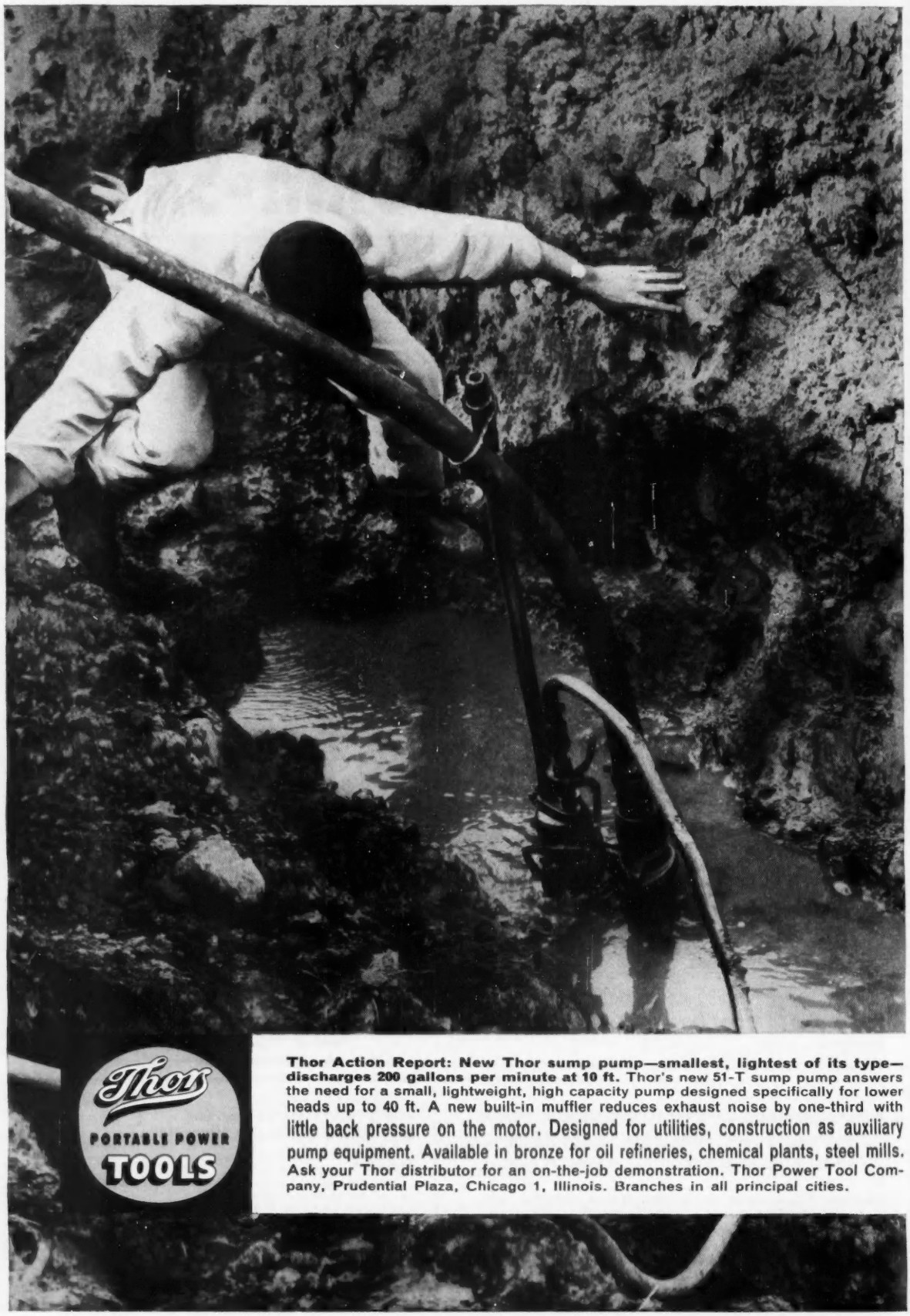

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ACI Previews Tomorrow's Highways At Chicago Meeting

ONE COMPLETE SESSION of the American Concrete Institute 54th annual convention in Chicago was devoted to previewing highways of the future based on present design requirements, construction practices, and experimental work now going on with concrete pavements. In view of the expanded highway program now in progress, it was emphasized that highway engineers should be thinking of present design requirements for concrete pavement in terms of 1980, the latest target date for completion of the interstate system. It is quite likely that some of the experimental work now in progress will form the basis for the pavements of tomorrow.

Indications are that there will be a definite increase in the number of continuously reinforced concrete pavements constructed. Prestressed concrete has also proved feasible for pavement slabs in experimental projects. It is quite possible that some modification and/or combination of these types of construction will be the design of the future.

At the present time, permissible axle loads for commercial vehicles range from 18,000 to 22,400 pounds. The tendency to increase axle loads in certain areas will continue. Permits for operation of heavy haulers equipment are increasing rapidly each year; axle loads as high as 35,000 pounds on multiple wheel axles are becoming common. The frequency of axle load applications, a major factor in pavement design, is increasing in proportion to increase in traffic and travel trends. Between 1950 and 1956 there was approximately a 7 percent per year increase in ton-miles carried by commercial vehicles. This continuing trend could represent an imposing load to be carried by the pavements of 1980. All of these load factors must be considered in selecting design wheel loads in building today's pavements for tomorrow's use.

In view of the trend in modern transport, it is expected that no road will be constructed less than 24 feet wide regardless of traffic conditions or cost. The transition from 12-foot lanes on expressways to 11-foot lanes on other systems creates a driving hazard; besides, the extra foot per lane adds materially to the structural strength of the pavement and its economic life.

Another factor facing highway engineers is the rapidity with which concrete, as well as other types of pavement surfaces, becomes slippery when wet under modern traffic. The ultimate answer may be an entirely new concept in concrete pavement mix design, particularly for the top part of the slab.

Road tests indicate that paved shoulders have a definite beneficial effect on pavement performance. Paved shoulders in the long run should pay for themselves by extending the structural life of the slab and at the same time reduce maintenance cost and provide greater safety and mobility convenience to the highway user.

Prestressed Concrete Pavement

Although a few experimental prestressed concrete pavements have been built in the United States, the countries in which the largest share of investigative work in the form of field slabs and tests has been undertaken are England and France. Such investigations have proved that it is possible to augment sufficiently the strength of concrete in tension by inducing an initial compressive stress that a pavement slab so constructed will have a load bearing capacity many times that of a conventional concrete slab of the same thickness on the same subgrade. There are two general methods by which the concrete may be prestressed; namely, through the use of post-tensioned cables or through the use of hydraulic jacks reacting against abutments. Prestressed pavement promises to become competitive from a cost standpoint with conventional pavement. The cost differential is bound to be reduced as contractors gain experience and techniques are perfected.

Continuous Reinforcing

Subcommittee 7 described briefly the continuously reinforced pavements which are now under observation, discussed their performance, and summarized the present state of knowledge on the subject.

Over the past 40 years, pavement design has passed through a variety of phases: plain concrete pavement without joints, plain concrete pavement with expansion joints, plain concrete pavement with both expansion and contraction joints, plain concrete pavement with contraction joints only, and reinforced concrete pavements with similar variations in the use of joints. In addition there have been wide differences in the spacing of joints varying from 15 to as much as 1000 feet.

Joints of various designs have been used with varying degrees of success but they continue to be points of potential structural weakness, present maintenance problems, and permit infiltration of water and soil. Often the joints adversely affect riding quality.

Many thousands of miles of pavement using the various joint types and spacing have given satisfactory service but the fact that joints have introduced problems which were not readily solved has caused engineers to think about building continuously reinforced pavements, thereby eliminating closely spaced joints.

It is quite likely that some modification of the experimental continuously reinforced concrete pavements will prove to be the standard design for future concrete highways.

Concrete Overlays

Concrete overlays or concrete resurfacing have an experience record of widespread use in the United States. During 1957 a survey of all known street and highway concrete resurfacing projects included over 300 projects in 28 states; of these, 40 percent were rated as in excellent condition, 40 percent as good, 18 as fair, and only 2 percent as poor. (MORE)

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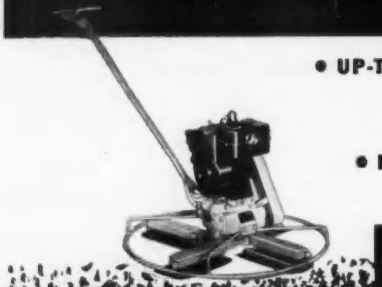

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New Officers

Douglas McHenry, Portland Cement Association, and Joseph W. Kelly, University of California, were named president and vice-president of the American Concrete Institute at its convention in Chicago.

Douglas McHenry

Mr. McHenry, director of development, Portland Cement Association, Chicago, was elected for a 1-year term as president of the Institute. He succeeds Walter H. Price, head of the engineering laboratories, U.S. Bureau of Reclamation, Denver.

Mr. McHenry has been a member of ACI since 1936 and is now completing his second year as Institute vice-president. He is well known in engineering circles as the author of numerous articles on concrete technology and, in particular, for his work while head of the structural research section of the engineering laboratories of the U.S. Bureau of Reclamation prior to joining PCA in 1952.

Joseph W. Kelly, professor and vice-chairman, department of civil engineering, University of California, Berkeley, was elected to a 2-year term as vice-president. Professor Kelly, a 30-year member of ACI, served on the ACI Board of Direction from 1952-54 and was elected in 1956 to another term as a director. He served as author-chairman of Committee 611, Inspection of Concrete, throughout the first and second editions of the *ACI Manual of Concrete Inspection.*

Professor Phil M. Ferguson, chairman of the civil engineering department, University of Texas, Austin, was elected to a 2-year term as vice-president of the Institute at the 1957 convention and will continue to serve in that capacity. END

Air Force Academy, Colorado Springs, Colo. T. F. Scholes, Reading, Pa., gen. contr., Long Const. Co., Kansas City, Denver and Detroit, sub-cont., Skidmore, Owings and Merrill, Architect.

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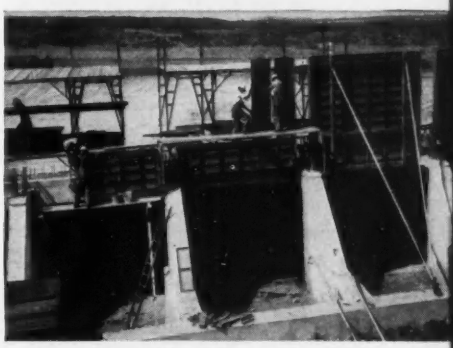

Symons Steel-Ply Forms being erected for the second lift. Note "work wagons" in the background.

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builders' problems defined at meeting

Members of the Building Research Advisory Board and the Board of Governors of the Building Research Institute at a joint meeting in February agreed emphatically that more and better scientific facts must be made available upon which the building industry can rely to improve its technology and ability to cope with the projected construction boom of the '60's. In an effort to define problems, open discussion followed each of 11 speeches by men representing various segments of the industry or related professions. E. X. Tuttle, chairman of the Building Research Advisory Board, stated that this list of problems is a first effort of its kind, representing in its present form the personal views of the speakers, and that study will be necessary before a comprehensive report of building industry problems can be developed and approved by BRAB. "Many of the things to be done in the stimulation and report of research are jobs for BRAB and BRI themselves, as was originally intended. A start has been made in the right direction, but we are all agreed that these activities must be greatly increased with the cooperation of the building industry and the research institutions of the United States," Mr. Tuttle said.

Of particular interest to architects was the problem of an ingredient to add to concrete which will make it vapor-proof, watertight and self-sealing.

Topping the list of problems facing the contractor was how to reduce costs. He also needs: a budget which allows for changes in design decisions which might improve the building so that the final version of the design need not be stripped down to a point where lowest possible first cost has become the overriding factor; more time allowance for study in the design stages to assure the best that technology has to offer; orderly, timely and efficient delivery of bulk materials, manufactured items and sub-assemblies and efficient placement of these items on job-site; a means of handling of labor where new components for buildings do not fit traditional divisions of work by trades, a problem now being collaborated upon by the Associated General Contractors of America and labor organizations; further study of the effect of temperature and humidity differentials on all parts of buildings; and, finally, more knowledge of expansion joints for concrete slab and quarry tile roofs.

lift-slab buildings are setting records

The tallest lift-slab building in the United States a 14-level, 200-car parking garage in Columbus, Ohio, will rise 95 feet. Topped only by a Mexico City apartment house project 101 feet high, the garage is the second tallest lift-slab building in the world. All records may soon be broken, however, by a 16-story, lift-slab apartment being considered in Miami.

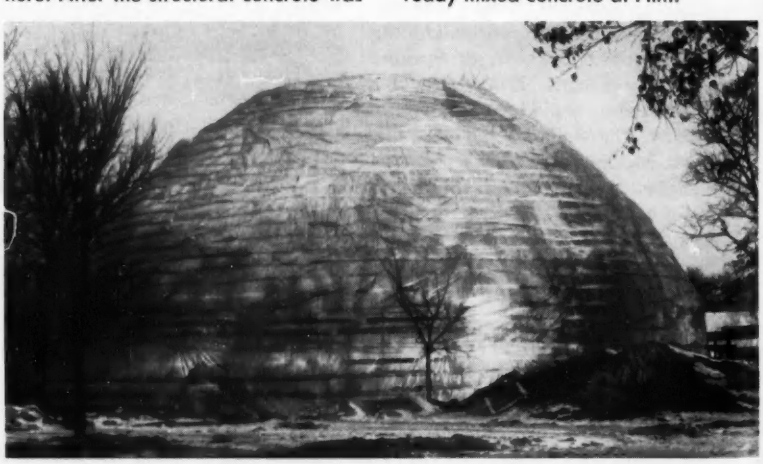
building in Rio de Janeiro collapses

In spite of concerted efforts by engineers to save it, a new 11-story reinforced concrete building in Rio de Janeiro overturned recently. Since the building began to settle early in 1956 engineers had been watching it and on January 24 of this year noted that the rear of the building was settling rapidly and immediately started underpinning operations. The failure was thought to be due to improperly constructed or too short piles and crews worked night and day to get new piles in place. By January 29 the rate of settling was still increasing, however, and police ordered the building and adjacent areas evacuated.

This failure is the twenty-first such catastrophe in Rio de Janeiro within the past ten years and the Brazilian press is clamoring for revision of building codes and design requirements. One engineer is quoted as having predicted that half the city would crumble in the event of even a minor quake.

plastic film keeps construction on schedule

Although the concrete work for the construction of a 90-foot diameter planetarium at Flint's College and Cultural Development in Flint, Michigan, was completed before cold weather set in, the completion date of March 1 would have been a completely unobtainable objective without the polyethylene film enclosure shown here. After the structural concrete was completed, the contractor built a temporary wooden frame 60 feet high and 110 feet in diameter at the base to protect the project from the ravages of winter weather. The 30,000 square feet of plastic film not only retained heat in the construction area, but also admitted generous amounts of daylight. The contractor for the job is Erickson and Lindstrom of Flint. The polyethylene film was supplied by Catsman Company, which also deals in ready mixed concrete at Flint.



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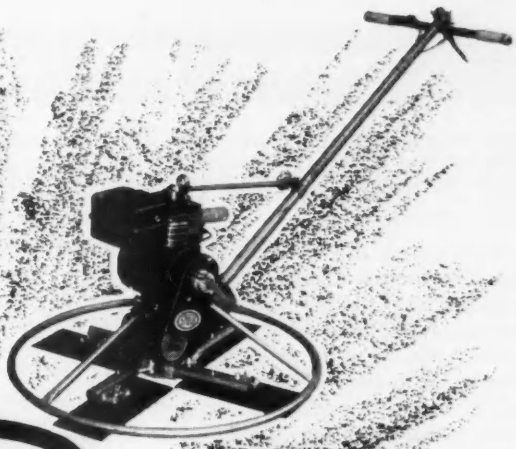

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Into each unit of STOW-built construction equipment goes years of research in the field, months of testing new designs on the job, plus 80 years of STOW engineering know-how. STOW maintains close contact with contractors, keeping abreast of their current problems . . . incorporating their needs into the STOW line of construction equipment.

Every day more contractors rely on STOW Concrete Construction Equipment for the dependable service and the performance today's contracts demand.

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book reviews

1957 National Wage Chart. *Published by Builders Association of Chicago, 228 North LaSalle Street, Chicago 1, Illinois. $1.50.*

Hourly wage rates of building construction workers in more than 140 principal cities in the United States and Canada are presented on this wage chart. Collateral information includes data on the hourly work week of each of the trades covered in the various cities, and there is also an indication of the trades having welfare and pension benefits in certain locations.

Estimating General Construction Costs. *By Louis Dallavia. Published by F. W. Dodge Corporation, 119 West 40th Street, New York 18, New York. 197 pp. Illus. $8.50.*

This is the second edition of an accurate, easy-to-use handbook presenting a new method for estimating all direct production costs in earthwork, reinforced concrete work, structural steel work, masonry and carpentry. The estimating technique described was devised and perfected by the author during his 22 years as a specialist in estimating building and heavy construction. The method is said to provide an easy and rapid method for determining shift cost, output range, and unit cost by applying an easily obtained productivity percentage against only three tables. The system takes into account such variables as job conditions, weather, the general economy, equipment quality, and others, and is equally valid for any part of the country since the tables provide for built-in corrections for all job conditions and all job levels.

To render the book more useful to non-professionals and beginners in the estimating field, estimating form sheets and check lists for each type of construction have been included, along with a number of tables for masonry and concrete work which schedule unit costs in both square-foot and cubic-foot terms. There are over 160 tables in the volume and a comprehensive 5-page index permits easy reference.

Manual of Standard Practice for Detailing Reinforced Concrete Structures. *Published by American Concrete Institute, P. O. Box 4754, Redford Station, Detroit 19, Michigan. $4.00.*

This new volume represents a condensation into a single manual of two former titles: "Manual of Standard Practice for Detailing Concrete Highway Structures" and the "Manual of Standard Practice for Detailing Reinforced Concrete Structures." The new book represents a correlation of the latest improved methods and standards for preparing drawings for the fabrication and placing of reinforcing steel. For reference purposes the two main sections of the new manual have been designated as "Buildings" and "Bridges," grouping under the former heading all structures which would come under the city building code and under "Bridges" all structures which would come under a state highway department.

Incorporated into the book are 58 fold-in drawings offering the reader graphic illustrations of specific details of standard practices. Tables, text, and drawings have been corrected to embody the revisions of the latest ACI building code (ACI 318-56).

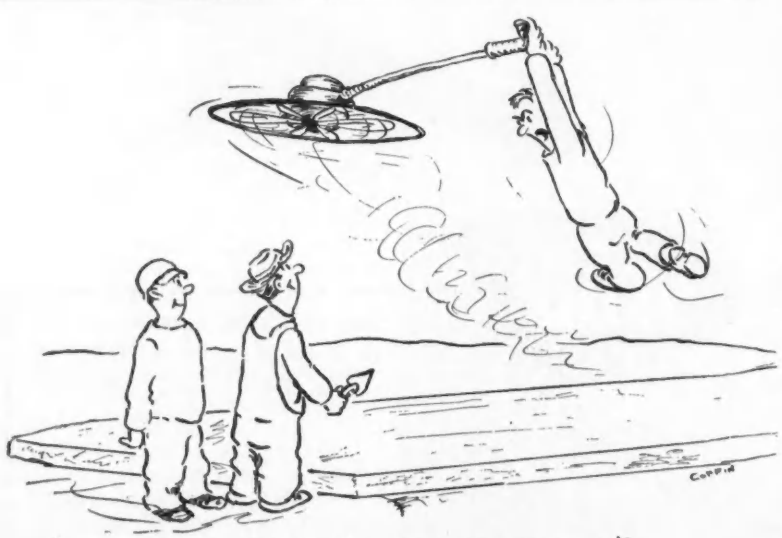
Concrete Products Manual. *Published by Florida Concrete and Products Association, P. O. Box 171, Winter Park, Florida. 270 pp. $15.00.*

This volume is the end result of two years of work by a 7-man committee formed by the Florida Concrete Products Association. Major subjects covered are ready mixed concrete, prestressed concrete, precast concrete, and concrete masonry. A unique feature is the provision of a free registration service which enables the purchaser to obtain without charge all additional inserts and changes which may be printed from time to time.

The function of each section of the manual is to present sufficient information on the subject to enable those who specify or work with concrete and concrete products to do so intelligently. The volume is in loose-leaf form, bound by a durable 4-color plastic cover, and the pages are printed on heavy stock to permit them to withstand repeated use.

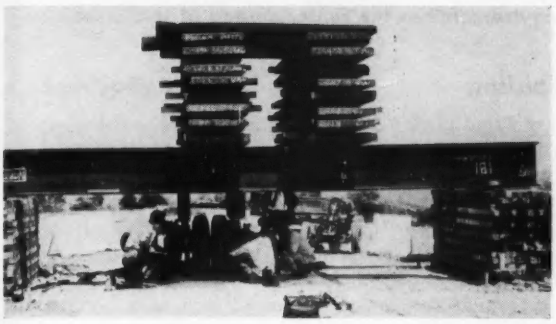
The volume is perhaps most remarkable in respect to its layout and format. Illustrations are of excellent quality and are used with a lavish generosity rare in such works. There has been a laudable effort to avoid complicated language and to lean heavily upon photographs or diagrams wherever these could serve better than words to convey the precise meaning.

Each section includes a sample specification for the use of the particular products under discussion, the specification in each case being illustrated with pictures to simplify comprehension. Each section has been arranged to take the reader in logical sequence from a definition of the product up to the final placement and inspection of the product in place. Although the manual was plainly designed for use in Florida, the material it contains is applicable to any part of the country.



equipment tools materials

Additional free information concerning any item described in these columns may be obtained by filling out and mailing the postage-free reader service cards which may be found in the center spread of this issue.

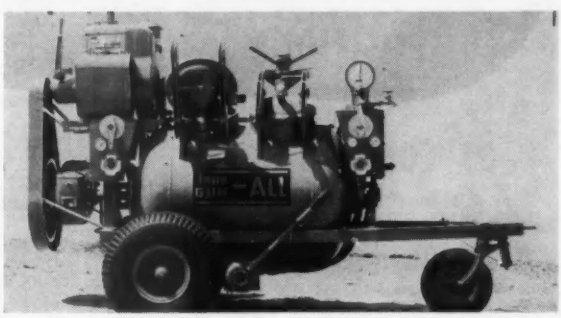


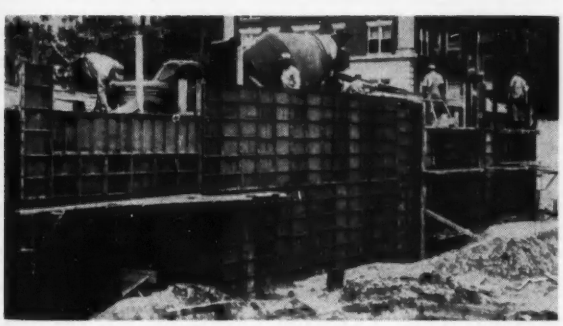
Test Prestressed Roadway

Tests are being conducted on the experimental prestressed concrete roadway which this magazine discussed the July 1957 issue. In this picture, tremendous weight is being exerted on the concrete by jacking up against the overhead beam. The prestressed concrete slab is only 5 inches thick as compared with the 10-inch thickness of normal highways. It also eliminates six joints every 600 feet. Wire strands running inside the concrete through flexible tubing hold the concrete in compression. **Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh, Pennsylvania.**

Pneumatic Placement

The True Gun-All can be used for mixing, placing, grouting and conveying. Wet mixing at the drum mixing chambers accomplishes positive mixing action and thorough blending. Hydration under positive mechanical control occurs at the mixing chambers, eliminating guess-work by the nozzle-man. Wet mixing with controlled hydration produces a mix that results in a better bond to reinforcing steel. The machine is said to be ideal for building swimming pools, dams, tanks, thin shell structures and hyperbolic paraboloid roofs. **True Gun-All Equipment Corporation, P. O. Box 2526, Tulsa, Oklahoma.**



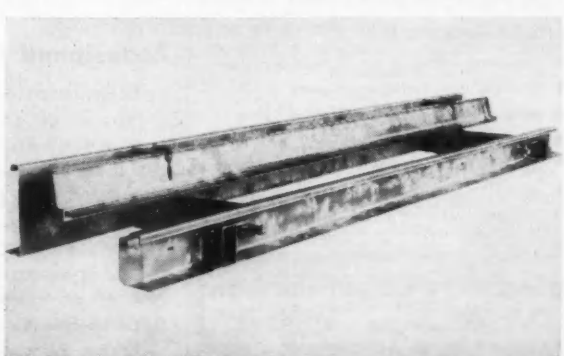


Magnesium Framed Forms

Construction costs on a St. Louis motel were cut by the contractors, H. A. Dailey, Inc. of St. Louis, by the use of 5,000 square feet of Symons Mag-ply forms for the 43,000 square feet of forming on the motel's retaining wall and foundations. Piers and columns were formed with Symons column clamps. The forms were particularly economical in their speed of erection and their number of reuses—8½ times on this job. **Symons Clamp & Manufacturing Company, 4249 West Diversey Avenue, Chicago 39, Illinois.**

Curb and Gutter Forms

This line of concrete curb, curb and gutter, integral curb and sidewalk forms is said to greatly reduce form setting and stripping costs, as compared with wood forms. Features include complete interchangeability, and division plates which may be removed without disturbing the front and back forms. The forms are held accurately to line and grade by keying to steel stakes. **Metal Forms Corporation, 3300 North Booth Street, Milwaukee 12, Wisconsin.**



Techniques and Data...

for making and testing all types of CONCRETE

Best ways of placing and curing—improved methods of testing and inspection—important facts on the properties of component materials—these and other matters are treated in a new book which offers you *a wealth of practical information* on every phase of concrete work.

COMPOSITION AND PROPERTIES OF CONCRETE

By G. E. Troxell and H. E. Davis
Professors of Civil Engrg., U. of Cal.
434 pages, 6 x 9, 161 illustrations, $7.75

EACH OF THE ESSENTIAL FACTORS in making and using concrete successfully is explained in this book. It thoroughly covers materials and operations in a way that helps you insure top economy and efficiency. Properties of component materials, including cements, aggregates, admixtures, and water, are analyzed. Proved methods of proportioning, batching, mixing, placing, and curing are described in detail. The book also presents the best accepted techniques for inspecting and testing concrete—enabling you to control quality within well-defined limits.

Strength of hardened concrete . . . permeability . . . durability . . . shrinkage and expansion due to moisture changes . . . creep . . . elastic, thermal, and other properties . . . you are shown their significance and how they are affected by the many steps in fabricating the final product.

DETAILED METHODS OF

- measuring entrained air in fresh concrete
- handling and storing aggregates
- using accelerators and antifreeze agents
- determining composition of fresh concrete
- checking weighing equipment for batching
- conveying concrete pneumatically
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equipment tools and materials

Additional free information concerning these items may be obtained by mailing the reader service cards in the center spread of this issue.

Light Duty Scaffolding

A new light duty scaffolding made with a stainless spring lock speeds up work, and is well adapted to small scaffolding jobs for contractors and maintenance crews. It will safely support loads up to 50 pounds per square foot. Sections are made up of only four parts, two frames and two pivoted cross braces. **Carmic Manufacturing Co., Inc., 2nd & Montgomery Avenue, Philadelphia 22, Pennsylvania.**

Soil Testing

Laboratory re-enactments of the three dimensional stresses on a given soil, up to failure point, are now possible with this triaxial test apparatus which is designed for teaching and test laboratories and consulting engineers and contractors who are concerned with the performance of subsoils underlying heavy structures, or of soils for use in heavy-duty aggregates. **Soiltest, Inc., 4711 West North Avenue, Chicago 39, Illinois.**

One-Man Vibrator

The universal motor of the Master "One-Man" Vibrator is in the vibrating head. There is no flexible shaft to carry and no loss of power from motor to vibrator. The operator plugs the cord into a 115-volt AC or DC outlet or portable generator, drops the vibrator head into the concrete and guides it. **Master Vibrator Company, 1752 Stanley Avenue, Dayton 1, Ohio.**

Redesigned Crane

The redesigned H-5 Hydrocrane has a capacity of 12 tons and increased horsepower. An added hydraulic circuit gives a total of three independent circuits. A more powerful boom hoist, stronger outrigger boxes and high alloy steel in hoist standards also contribute to increased crane capacity. It mounts on standard low-cost truck. **Bucyrus-Erie Company, South Milwaukee, Wisconsin.**

Electric Nailing Machine

This nailing machine drives up to 3 nails per second. It uses regular 8d box nails which are stored in a slot chamber and can be reloaded by its automatic sorter in approximately 1½ minutes. The machine can be detached from the hammer for use with other attachments for drilling, gouging, scraping, chiseling and trenching. **B & H Homes, Inc., 1428 Iron Street, Kansas City 16, Missouri.**

Engineer's Tape

The Evans Engineer's Tape combines tenths and eighths scales on one side of the blade, enabling instant conversions merely by glancing at the blade. Carrying two tapes is eliminated. The steel blade is bonderized and coated with white enamel and a protective coating. A combination hook and ring enables one man to make measurements unassisted. **Evans Rule Company, Elizabeth, New Jersey.**

Acid Proof Concrete

An acid proof concrete is now available for use in industrial plants for installations subjected to acid conditions. For monolithic tank linings the material is poured into forms in accordance with usual practice for concrete. In floor construction it may be applied as a topping over concrete, brick or tile. **Sauereisen Cements Company, Pittsburgh 15, Pennsylvania.**

Clutch Control

The clutch control on this concrete troweling machine prevents accidents by stopping trowel blade rotation when the operator releases the lever mounted on the handle. It disengages the clutch assembly without stopping the engine, eliminating re-starting. Rotation is resumed by depressing the lever. **Champion Manufacturing Company, 2028 Washington Avenue, St. Louis 3, Missouri.**

equipment and tools

For more information mail cards facing page 16.

Refraction Seismograph

Contractors and engineers will find this instrument useful for subsurface exploration without drilling. Subsurface materials can be identified, depth to bedrock determined, and the presence or absence of bedrock or solid material at any depth up to 50 feet can be ascertained. Features include miniature size, direct reading, and easy operation. Using complete transistorization, the weight of the entire equipment exclusive of sledgehammer source is only 16 pounds. An illustrated instruction manual describes all phases of operation and interpretation. **Geophysical Specialties Company, 4206 Longfellow Avenue, Minneapolis 7, Minnesota.**

Polyethylene Film Dispenser

Easier on-the-job handling of polyethylene construction film is promised builders and contractors with a new "double folded" roll, packaged in a special carton which permits pull out and cutting of the sheeting without removing the roll from the box. The patented carton, designed like the housewife's wax-paper box, is available in several sizes. The box just over four feet in length contains 100 feet of four mil (.004 inches) film in the popular 16½-foot width. The two and a half-foot box contains 100 feet of the 10½-foot width. **The Kordite Company, Macedon, New York.**

Repair Material

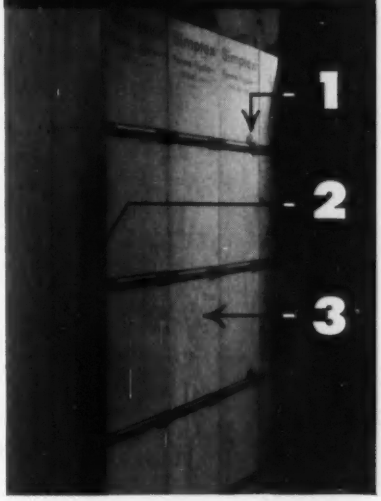
Tests on Maguire's Emeri-Bond, a non-reversing neoprene bonding material, designed to hold heavy duty Cortland emery aggregate concrete resurfacing material to an old concrete floor, showed tensile strength and resistance to side pressure greater than that encountered in everyday industrial applications. Impact tests on unreinforced slabs revealed resistance similar to that of a monolithic slab, indicating that patching material held by a neoprene bond should be as resistant as the original floor to impact of heavy objects. **Walter Maguire Company, Inc., 60 East 42nd Street, New York 17, New York.**

Test Floor System

A completely electrified cellular floor system has been subjected to a fire test to determine if such a construction system can obtain a fire retardant rating. The electrified area withstood the requirements for 3 hours. The floor was built of E/R Cofar and standard Cofar units made of deep-corrugated galvanized steel sheets. The steel serves as a tight form for wet concrete and becomes the main positive reinforcement when the concrete sets. **Granco Steel Products Company, 6506 North Broadway, St. Louis 15, Missouri.**

Simplex
FOOT-A-MINUTE forms

OFFER YOU ADVANTAGES THAT MEAN MORE PROFIT



FASTER SET-UP and STRIPPING
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1 **PATENTED LOCKING LEVER**

Made of precision-finished, hardened steel. Bolted permanently to forms. A tap on lever locks or unlocks it. Cam action pulls panels together, minimizing seam marks, and giving positive wall dimension.

2 **SIMPLEX TIE WIRES**

Specially designed steel tie wires are made to withstand pressures up to 4,000 lbs., yet easily broken off without twisting in wall. Simple to drop in place . . . held securely by locking lever.

3 **PLASTIC PANELS**

Simplex panels are highest grade 1¼" impregnated plastic plywood backed with four 2" x ¼" metal bars running the full width of each 8' panel. Construction gives greater strength than 2 x 4 backed forms with double walers. Full size 2' x 8' panel weighs only 65 lbs. Four, six and ten foot panels also available.

IT ALL ADDS UP TO A COMPLETE FOUNDATION IN 24-MAN HOURS OR LESS WITH REDUCED LABOR COSTS

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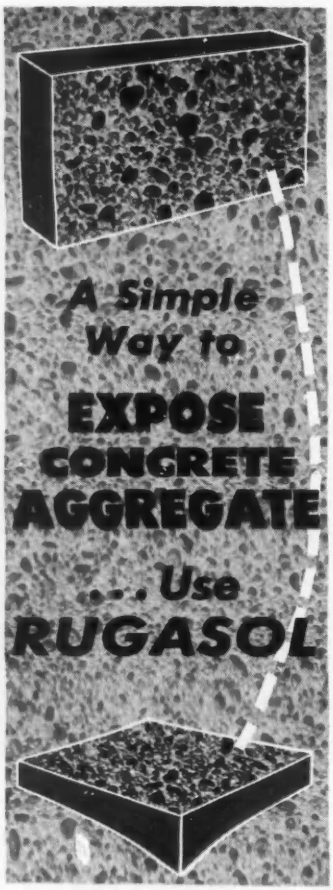

You will find that exposing concrete aggregate with Sika Rugasol is simple because it eliminates the need for costly chipping, hacking or sandblasting. There are two types of Rugasol:

RUGASOL F . . . is painted directly on formwork. When forms are stripped (in 2 to 5 days), the retarded mortar is removed with a jet of water or stiff brush.

RUGASOL C . . . is applied on the surface of freshly placed concrete. On the following day, the retarded surface mortar is removed with a jet of water or stiff brush.

For complete information on Rugasol, call or write for Bulletin RG-58.

Ad 26-4

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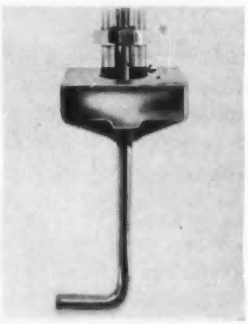
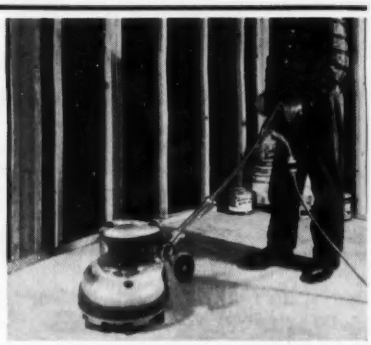


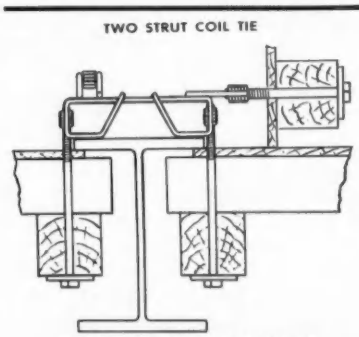
Anchor Bolt

This new anchor bolt fitting eliminates the protruding anchor bolt that is a traffic hazard in new plant construction and the time consuming errors so often found in the initial setting of anchor bolts when concrete is being poured. The anchor is flush with the floor until the actual installation is made. **Decatur Engineering Company, 519 East William Street, Decatur, Illinois.**

Floor Maintenance

The machine pictured here, with proper attachments, will perform ten different jobs on home and industrial floors, concrete, tile, wood, or terrazzo. In this photograph it is equipped with a portable electric concrete grinder with six grinding stones which quickly grind concrete, old or new. **The American Floor Surfacing Machine Company, Division of American-Lincoln Corporation, Toledo 3, Ohio.**



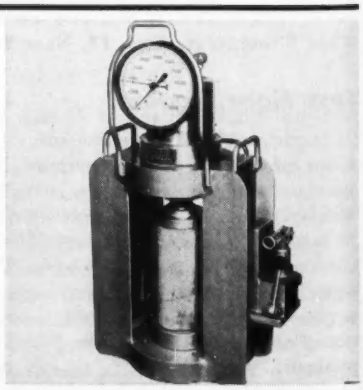


Form Accessories

Capacities of these coil ties range from 6,000 to 36,000 pounds. Forming costs are reduced since fewer ties and larger panels can be used. Coil hangers for fast, economical form erection are available for loads of 3,000, 7,500 and 10,000 pounds per side. Coil hanger frames are used where beams are not fireproofed. **The Dayton Sure-Grip and Shore Company, Kercher Street, Miamisburg, Ohio.**

Portable Testing Machine

The 250,000-pound capacity portable testing machine can be used in field, plant or laboratory testing of concrete cylinders and beams and other construction materials. No electrical or pressure connectors are required. Operation is simple. Loads are developed by means of a hand-operated, 2-speed concentric pump which actuates the piston of the main hydraulic system. **Soiltest, Inc., 4711 West North Avenue, Chicago 39, Illinois.**



equipment and tools

For additional free information mail cards facing page 16.

Finishing Product

This economical, tile-like material is sprayed directly on concrete, stucco and plaster by low pressure spray equipment to form a tough, colorful, seamless and glazed surface which will stand up indefinitely to outdoor exposure and indoor traffic without maintenance or refinishing. Surfaces are cleaned with soap and water. The cost is approximately 60 cents per square foot. **Vitricon, Inc., Long Island City, New York.**

Only Two Moving Parts

This pneumatic concrete vibrator consists of only two moving parts. A built-in, pneumatically driven vibrating element eliminates the need for separate air motor, transmission and bearings. The line consists of three head sizes, ranging from 2⅜ up to 3 inches. Especially suited for confined working areas, the vibrator can be inserted in the concrete all the way up to the air exhaust. **Vibro-Plus Products, Inc., Stanhope, New Jersey.**

Concrete Gunning Machine

This machine has a maximum gunning rate of 9 cubic yards per hour. It is particularly recommended on jobs where high production is a necessity. The various controls make it useable for the gun application of castable refractories, insulating concretes, high temperature concretes and sand and cement concrete. **Air Placement Equipment Company, 1009 West 24th Street, Kansas City, Missouri.**

Hydraulic Cutter

This device cuts through carbon and alloy steel rods, reinforcing rods and drill rod in sizes up to 1⅜ inches diameter quickly and safely. Equipment consists of a light weight portable cutterhead, a heavy duty power pump to supply oil pressure, and a single high pressure hose of convenient length to deliver oil to the cutterhead. **H. K. Porter, Inc., Somerville 43, Massachusetts.**

strong & rugged.. fast & safe

CHALLENGE
INSTANT TROWEL
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FLOATING & FINISHING
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36" and 48" Models

One quick look at the Challenge Instant Trowel, side by side with ANY competitive machine, is all you need to prove it is the strongest, most rugged machine on the market. Compare the rugged dual handle; ¾" stationary guard ring; the extra strong spider plate with 1" hex bars — the 1¼" main shaft is the largest in the industry

The Challenge operates at 145 RPM and completes the job in much less time. It is as much as 50% faster than some machines.

Finger tip controls are conveniently located for safe, easy operation and assure positive set blade adjustment and engine speed. Mercury safety shut-off switch is another extra safety feature.

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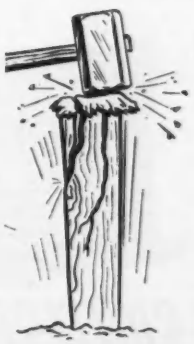

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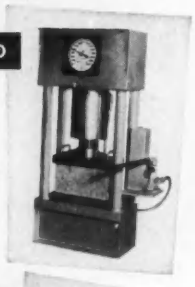
300,000 POUNDS

For Laboratory and Plant use in tests of Blocks, Beams, Cubes or Cylinders.



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200,000 POUNDS

For Job-site, Plant or Laboratory testing of Cylinders, Blocks, Beams and Cubes.

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The Kelly Ball is a new direct method of testing concrete consistency at the job-site either from the batch or in forms.

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DYNAMIC
SIEVE SHAKER

A modern, new type Laboratory Shaker that insures quick and complete sieving of aggregates.

Many other units of Engineering Test Apparatus for Concrete Testing are available. Soiltest's New Catalog covers completely all testing equipment and accessories used in this field. Illustrated Bulletins describe Apparatus shown above.

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literature

FREE copies of these items may be obtained by mailing the reader cards facing page 16.

Power tamper. Bulletin KT-108 summarizes the advantages of the Kelley Power Tamper for fast efficient compaction and finishing of sand, gravel, stone or soil backfill and bituminous paving and patching mixtures. Specifications are included. Kelley Machine Division, Wiesner-Rapp Company, Inc., 285 Hinman Avenue, Buffalo 23, New York.

Repair material. A folder discusses the properties of Weld-Crete, a liquid bonding agent with which new concrete is permanently bonded to old concrete without the need for chipping, drilling, roughening, acid washing or scarifying of the concrete base. It is applied by brush or spray to structurally sound concrete or most any other sound surface, even glass, and finished off with the required thickness of new concrete or cement topping. New concrete may be applied over Weld-Crete in one or two hours, or application may be postponed for as long as ten days. One gallon covers 250-400 square feet, depending on conditions. Larsen Products Corporation, 4934 Elm Street, Bethesda, Maryland.

Metal molds. A catalogue gives specifications and prices of a line of metal molds for splash blocks, window wells, chimney caps, step-treads, garden benches and tables, trash burners, stepping stones, pool copings and parking and traffic accessories. Vibrating tables, concrete inserts and Swiss form oil are also included. R. L. Spillman Company, Box 534, Station G, Columbus 7, Ohio.

Asphalt liners. Hydromat Asphalt Liners provide a practical and economical product for the complete containment of water, wastes, sludges and sewage in irrigation projects, soil conservation programs, industrial reservoirs and waste control ponds, municipal water and sewerage projects, residential pools and military installations. Bulletin H56 describes how the product is manufactured, gives specifications and shows typical installations. The material may be laid over earthen subgrades or old concrete or asphalt linings. W. R. Meadows, Inc., 2-18 Kimball Street, Elgin, Illinois.

Films on steel. A brochure describes 20 color-sound films prepared by Bethlehem Steel Company. Of particular interest to engineers and architects is one entitled "Steel in Concrete," a study of the forces at work upon both reinforced and unreinforced members and how these forces, determined through laboratory tests, are interpreted and applied. The role of reinforcing bars in concrete structures is explained. On-the-job scenes cover a variety of present-day structures made possible through the use of new-billet steel in reinforcing bars. Bethlehem Steel Company, Bethlehem, Pennsylvania.

Plastic form liners. Lustreform No. 2900 is a specially compounded plastic which is molded from flat sheets into decorative shapes by conventional equipment over inexpensive forms of wood, plaster, and so forth. Form liners made of Lustreform No. 2900 are reusable. They are semi-flexible and are placed in conventional forms. No special mixes are needed since the high polish on the plastic is picked up by the concrete. Described in a folder, 57-3, available from United States Rubber Company, 2638 North Pulaski Road, Chicago 39, Illinois.

Air entraining agent and curing compound. These two products are discussed in a bulletin. The first is a wetting agent with excellent dispersement properties useful in easier placement and workability of concrete. The second is a membrane-type liquid designed to produce proper hydration of cement in newly-laid concrete surfaces. Details on how to apply, specifications and availability are included. Presstite-Keystone Engineering Produces Company, 39th and Chouteau Avenue, St. Louis 10, Missouri.

Power trowel. The Challenge Instant-Trowel floating and finishing machine is described in bulletin F-701. According to the manufacturer the use of 4 trowels has resulted in faster, smoother operation. The special heat treated steel combination blades float and finish in one operation, producing a flat, dense, wear-resistant concrete slab. Cook Brothers Equipment Company, 3334 San Fernando Road, Los Angeles 65, California.

literature

FREE copies of these items may be obtained by mailing the reader cards facing page 16.

Grinding Concrete. A new 4-page illustrated bulletin gives complete information on the proper accessories and speeds for both wet rubbing and dry grinding concrete. The proper equipment for finishing hardened concrete walls is shown, as well as for finishing concrete floors and ceilings. For a free copy of bulletin No. 5727 write Stow Manufacturing Company, 354 Shear Street, Binghamton, New York.

Form panels. Uni-Form Panels are completely assembled and modular in design so that all sizes member with one another. They are made of best exterior grade plywood with rigid steel frames. They may be rented or purchased and the manufacturer offers engineering and field service. Catalog 125 describes this equipment and is well illustrated with pictures of form panels and accessories and many on-the-job applications. Universal Form Clamp Company, 1238 North Kostner Avenue, Chicago 51, Illinois.

Handling equipment catalogue. Sixty pages of illustrations, descriptions and specifications on Syntron vibrators, packers and jolters, car rappers, hopper level switches, flow control valves, feeders, screens, parts feeders, lapping and polishing machines, shaft seals, paper joggers, selenium rectifiers and rectifier units, infra-red heating elements and panels, power tools and concrete finishing equipment make up catalogue No. 5712 which is available from Syntron Company, 323 Lexington Avenue, Homer City, Pennsylvania.

Forming equipment. A booklet shows how Atlas Compo Forms are assembled and their use on various jobs. They are designed and made to assure rapid, accurate forming. Composed of welded high-tensile steel frame and plastic-coated plywood face, the forms are re-usable and may be rented with an option to buy. The manufacturer offers engineering assistance for any type of forming requirement. Specifications are included, and form accessories are illustrated and described. Irvington Form & Tank Corporation, 20 Vesey Street, New York 7, New York.

Manual on handling and placing. The outlines, illustrations and suggestions in this valuable booklet are the results of many years of experience of men from various phases of concrete construction. Basic facts about concrete are explained. Other sections deal with measuring materials, handling, transporting and placing concrete, and the reader is referred to this manufacturer's line of handling equipment which is illustrated in the final section of the manual. A check list of specifications, job conditions and summary for concrete handling and placing is included. Gar-Bro Manufacturing Company, 2415 East Washington Boulevard, Los Angeles 21, California.

Lift slab construction. The lift slab method of construction is fully explained in a booklet with illustrations of projects on which it is being used as well as several finished buildings. For anyone interested in this subject the booklet provides an easy-to-read, complete explanation of the method, how it is used, and where it is applicable. Great Lakes Lift Slab Corporation, 5306 West Lawrence Avenue, Chicago 30, Illinois.

Curing-hardening compound. A folder describes Demicon Cure-Hard, a non-resinous membrane curing and hardening compound which accomplishes both jobs simultaneously. The material costs less than one cent per square foot of coverage. The folder gives chemical composition, ratings of resistance to chemicals, specifications and laboratory test results as well as pictures of projects on which the material was used. It may be applied by power spray, hand spray or hair broom. McMillan Products Company, 2045 East Eight Mile Road, Hazel Park, Michigan.

Concrete colors. A new chart shows 24 colors now obtainable with Lansco Dry Mix. The coloring material is dusted on the surface of the wet concrete mix after the concrete has been poured, and troweled until a uniform color shade is obtained. Landers-Segal Color Company, 78 Delavan Street, Brooklyn 31, New York.

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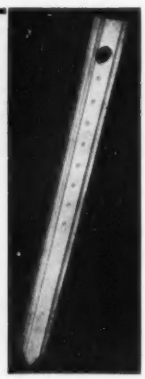

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